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**The role of accounting in the  
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Juliette Senn  
Mercedes Luque-Vílchez  
Carlos Larrinaga

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# **The role of accounting in the assessment of knowledge production from a multi-stakeholder's perspective**

## **Abstract**

**Purpose** – The objective of this study is to provide insights into how accounting and accountability systems can contribute to transforming metrics employed thus far in research performance evaluation. New metrics are needed to increase research impact on the challenges addressed by science. In particular, we document and reflect about accounting transformations towards Responsible Research and Innovation (RRI).

**Design/methodology/approach** – The study draws on the European H2020 MULTI-ACT research project that focuses on the development of a collective research impact framework in the area of health research. We document, analyze and report our engagement in this project, which also included research funders, patient organizations, health researchers, accounting practitioners and health care providers. Drawing on RRI, Mode 2 knowledge production and accounting performativity, we inquire into the potential of accounting technologies to foster knowledge production and increase research impact.

**Findings** – The study shows how the engagement of accounting with other disciplines enables the development of new and relevant forms of research impact assessment. We document how accounting can be mobilised for the development of new forms of research impact assessment (i.e., indicators that evaluate key accountability dimensions in order to promote RRI) and how it helps to overcome the difficulties that can emerge during this process. We also show how the design of multiple accountabilities' indicators, although chronically partial, produced a generative interrogation and discussion about how to translate RRI to research assessment in a workable setting, and the pivotal role of certain circumstances (e.g., the presence of authoritative actors) that appear during the knowledge production process for creating these generative opportunities.

**Practical implications** – This study illustrates the key role of accounts in the generation of knowledge. It also shows the value of considering the stakes of all affected actors in devising fruitful accounting approaches. This collective perspective is timely in the accounting discipline and could foster the connection between academics and practice which is so far under-reported. This perspective should be useful for policymakers such as the European Union and managers in the design of new policies, initiatives and practices.

**Social implications**– Discussing and devising appropriate research assessment frameworks is strategic for the maximization of the social impact of research results. Accounting has a key role to play in optimizing a sustainable return on investment in research.

**Originality/value**– How to assess research impact in a more balanced way is in an early stage of development. The study provides empirical and practical material to advance further work and develop its potential to broaden the conceptualization of accountability.

**Keywords:** Knowledge co-production, Research impact, Accountability, Stakeholders.

## **Research paper**

## 1. Background

According to the Nature Index (Nature, 2021), Spain features in 2021 as the 11<sup>th</sup> country in terms of the quality of research performed in its institutions, measured by the number of articles published in several prestigious journals. However, as of July 2021, sixteenth months after the Covid-19 lockdown was decreed in Spain, researchers in this country have been unable to bring any Covid-19 vaccine to clinical trial (Zimmer *et al.*, 2021). A potential explanation for this paradoxical situation in Spain is that the performance evaluation of science incentivizes to look well in rankings such as Nature (2021), while research impact in society goes unmeasured. This case is a cautionary example of how the translation of research discoveries to achieve maximum social impact is still a critical challenge. More generally, there is a dissatisfaction about research assessment in health research and concern about the effects of such assessment in the translation of research discoveries to improve the life of patients (Zaratin *et al.*, 2014; Zaratin *et al.*, 2016). Along these lines, Zaratin and her colleagues contend that the engagement with stakeholders beyond investors and peer reviewers, including for example patients, patient organizations, health researchers, health care providers, is a key factor for boosting research impact. Increasing the public value of science for the society as a whole is also a key concern for policymakers, e.g., the European Union (EU thereafter) (Mazzucato, 2018). EU is active in promoting through its funding actions responsible research and innovation (RRI thereafter) to connect the “processes and outcomes of Research and Innovation” (R&I thereafter) with “societal values” (Zaratin *et al.*, 2022, p.1; see also, Silva *et al.*, 2018; Von Schomberg, 2019) and to address the so-called ‘grand challenges’ such as environmental or social sustainability, health problems or demographic change (e.g., EU Horizon, 2020; Roger *et al.*, 2015).

In this study, we are interested in the role of accounting in the transformation of research performance evaluation towards RRI. This paper aims to provide insights into how accounting can contribute to transforming metrics employed thus far in research performance evaluation in order to foster the quality of current forms of knowledge production[1] assessment. Research assessment has traditionally focused on important impact dimensions: research excellence is usually assessed through peer reviewing and research efficiency through the return of investment. However, the transformation required by RRI requires to focus on further dimensions that reflect the positive returns of research investments expected by society, considered at large; and in this way, a

possible increase of research impact[2]. For example, in the case of health research, a sector with social implications “*involv[ing] the human element in every stage*” (Hussain *et al.*, 2019, p.291), society, public policy, the health system, patients or the scientific community, all of them have important stakes on research (Milat *et al.*, 2015; Rivera *et al.*, 2017; Zaratini *et al.*, 2022).

The connection of the processes and outcomes of R&I with the demands of multiple stakeholders requires a change of paradigm towards a broad understanding of the notion of *accountability* (e.g., Andreasson and Costa, 2014; Costa and Pesci, 2016; Pesci *et al.*, 2020), considering a variety of stakeholders in the design, measurement and operation of research and research evaluation (Pedrini *et al.*, 2018; Zaratini *et al.*, 2022). Such paradigm shift could stimulate new relationships with the most interested constituencies (Dillard and Vinnari, 2019), making the consideration of multiple views possible, and, therefore, foster the co-creation of new research assessment metrics. These metrics are expected to make each involved stakeholder’s return on “investment” visible and, therefore, drive research with a shared mission (mission-oriented research) (Mazzucato, 2018). The discussed paradigm shift and its focus on new research assessment metrics provides an opportunity for accounting research to inquire into an area (i.e., research assessment) with vast social implications. However, there is a dearth of accounting studies in this area. The theoretical lens followed in this paper conceives accounting and accountability systems as not just representation but also technologies making visible specific areas and generating concerns by creating new practices, definitions, pragmatic solutions, among others (Busco and Quattrone, 2015; Busco and Quattrone, 2018a, 2018b). Accounting and accountability systems are *performative* (Revellino and Mouritsen, 2015; MacKenzie, 2006). But connecting to the research object of this study, the performativity of research assessment metrics is ambivalent. On the one hand, conventional research metrics oriented towards the financial stakeholders and peer reviewers can produce short-sighted, ineffective science (Durose *et al.*, 2018). For example, the use of bibliometric indicators to measure research performance might encourage researchers to focus their energy on publishing articles, dissolving the scientific structures that can generate science with actual impact in society, as the Spanish Covid-19 vaccines case shows. On the other hand, extending the boundaries of accounting (for example, towards other constituencies with stakes in research impacts such as patients in the case of health research) can allow the exploration of the potential of

accounting in new approaches to knowledge production with “*implications on the individuals, organisations, institutions, societies, and the environment [i.e., social structures]*” in which accounting acts (Tregidga and Laine, 2021, p.6; see also Boedker *et al.*, 2020; Dillard, 2015, among others). This second accounting perspective fits better with the aim of shedding some light on how the transformation of research assessment metrics can increase research impact.

As a field study, we mobilize a case project, focusing on MULTI-ACT, which is in line with the RRI approach and aimed at constructing a collective research impact framework in the area of health research and innovation. The project involved research funding organizations, patient organizations, health researchers, health care providers, accounting practitioners and accounting researchers to assess the impact of the scientific research on a large number of stakeholders (beyond financial ones and peer reviewers). MULTI-ACT’s specific interest was to increase the impact of health research on patients with brain diseases. The paper focuses on the engagement of different project members involved around the proposal of research assessment metrics and accountability systems. In doing so, our investigation is making two contributions.

First, the paper advocates for a change in the conversation about research assessment to confront the innovation crisis. To date, research assessment has been mainly approached by accounting scholars from the perspective of individual researchers in the accounting discipline. Studies cogitate about the disproportionate use of rankings in academic assessment (e.g., Gebreiter, 2021; Gendron 2008, 2015; Humphrey and Gendron, 2015) and its consequences in, for example, the rise of conformity and homogeneity (Englund and Gerdin, 2020) and desingularization (Picard *et al.*, 2018) of accounting research. Notwithstanding the importance of the individual perspective, a look at the innovation crisis (Mazzucato, 2013a, 2013b, 2018) and the need for research (and research evaluation) to play a more positive role in the grand challenges (Mazzucato, 2018) calls for a broader perspective seeking to investigate accounting in the context of research assessment from a collective perspective. The call for accounting research in the development of this perspective is even more imperative since this discipline deals with performance evaluation systems and indicators and, arguably, research assessment metrics have pernicious effects in all scientific fields (not just accounting scholarship), having insidious effects in research impact, innovation, and the grand challenges of our society.

Second, studies problematizing research assessment have mainly focused on the impact of evaluation systems in the way research is conducted such as research products/publications (i.e., Gendron, 2008, 2015; Humphrey and Gendron, 2015), or other types of outcomes of the research process such as assessment metrics (i.e., Hulme *et al.*, 2020; Taylor, 2011). In contrast, this study provides further light “*on the process of achieving, and not just the outcomes of, research impact*” (Upton *et al.*, 2014, p.354, emphasis added). Particularly, this paper focuses on the exploration of the process of proposing and discussing new and relevant research assessment metrics and accountability systems in health research, a sector with multiple stakeholders implicated along its “supply chain” (i.e., Hussain *et al.*, 2019) and where, as a consequence, accounting and accountability play a crucial role. Such an exploration provides us the opportunity to understand how the intrinsic incompleteness of those accounting objects created opportunities for debating (e.g., Busco and Quattrone, 2015; Busco and Quattrone, 2018b) about how their transformation could foster research impact and the pivotal role of certain circumstances that appeared during the knowledge production process for enabling this generative power.

The remainder of this paper is structured as follows. Section 2 discusses two central ideas emerging in the interplay between accounting and RRI: (i) the public nature of science and the need to bridge the gap between science and society and, (ii) the performativity of accounting for the value of science. Section 3 provides an overview of the case illuminating this research. Section 4 elaborates on the relevance of accounting in the project conceptualization and the related framework, and the consequent creation of a master scorecard (thereafter MSC). Section 5 reflects on some observations derived from our engagement in the co-construction of new assessment research impact tools. Section 6 concludes and provides some final remarks.

## **2. Approaches to foster knowledge production and increase research impact**

Our central thesis is that transforming accounts of knowledge production can increase research impact. Central to this thesis is the notion of RRI, as a way to conceptualize the need to “*increase the public value of research*” (Yaghmaei, 2018, p.214) and research impact. As previously discussed, RRI has emerged as a “*potential bridge between science and the society that aims to increase the public value*” (Yaghmaei, 2018, p.214) and social trust in science and research (ETB, 2017). RRI seeks to foster the connection of R&I “*processes and outcomes*” with “*societal values*” (Delaney and Iagher, 2020; Kolk *et al.*,

2021; Silva *et al.*, 2018; Zaratin *et al.*, 2022), nurturing principles such as an ethical, reliable, repeatable and responsible approach in R&I practices (Flick, 2016; Jirotko *et al.*, 2016; Owen *et al.*, 2012; Von Schomberg, 2011), the respect of gender equality, or science literacy (Owen and Pansera, 2019). Two key elements of RRI are, on the one hand, the public nature of science and the need to bridge the gap between science and society and, on the other hand, the aim to increase the public value of science and, therefore, the need to measure such public value. Both issues are discussed in turn.

### *2.1 Society and the public value of science*

RRI discussions emerged in the 2000s (Owen *et al.*, 2012) and were adopted in EU policies about a decade later (European Commission, 2012). For RRI, the democratic (and inclusive) governance of the research and innovation purpose (Silva *et al.*, 2018; Weckert *et al.*, 2016) is pivotal to increase research impact. RRI implies fostering more inclusive research (Brey, 2016; Owen *et al.*, 2012; Owen and Pansera, 2019), engaging a multiplicity of stakeholders in research assessment, starting from the establishment of research priorities and the design of the research process. In fact, for some years now, it has been suggested that research impact requires communication between practice and research (e.g., Nutley *et al.*, 2007). More recently, Thapa *et al.* (2019) have highlighted the notion of *co-creation*, according to which the production of relevant knowledge can only be assured if all research stakeholders have an opinion in the research process to ensure that the research outcomes reflect the beliefs, needs and patterns of expectations of society (Mazzucato, 2018; Owen *et al.*, 2013). The engagement of multiple actors from “*the very beginning of the research and innovation process*” is a strategic driver for RRI (Thapa *et al.*, 2019, p. 2471).

The ideas of Mode 2 knowledge production can further illuminate the relevance of RRI co-creation. Mode 2 epistemology is grounded on the integration of theory and practice as a research method, proposing that valuable knowledge is produced through the collaboration between researchers, users of knowledge and other stakeholders in the context of knowledge application (Gibbons *et al.*, 1994; Nowotny *et al.*, 2003) and allowing the identification of innovations that respond to shared concerns (Nonaka, 1994; Nonaka and Takeushi, 1995). For instance, co-creating health research implies that researchers and all stakeholders in this sector (patients, citizens, policymakers, industry, researchers) should be engaged (Concannon *et al.*, 2012; Salvetti *et al.*, 2018) in a dialogic

process. However, the co-creation process might be complex. Issues related to moral pluralism (Pellé, 2016), asymmetrical distribution of power (Forsberg, 2014; van Oudheusden, 2014), inclusiveness (Spinello, 2003), or conflicting interests (Morton, 2015; Taddeo, 2016) could make RRI development a daunting task. This is particularly the case when stakeholders come from different groups (Costa and Pesci, 2016; Friedman and Miles, 2006). These issues are more likely to appear in the early stages of the knowledge production process where actors work intensively in sharing understandings, solving problems and exchanging perceptions (e.g., Lesser and Prusak, 2000).

## *2.2 Measuring the value of science: performativity*

Multiple frameworks have been proposed to provide research assessment a direction and measure the public value of research: “*payback model, expected monetary value, research impact framework, research excellence framework, logic models*” (Kork *et al.*, 2021, p.7; see also Milat *et al.*, 2015; Raftery *et al.*, 2016; Rivera *et al.*, 2017). These frameworks offer specific indicators to measure research impact. And yet, their measures of health benefits, efficiency, or the broader impacts on society are far from complete (Banzi *et al.*, 2011). The view of non-academic stakeholders’ (e.g., policymakers and end users) is still underrated and impact assessment often relies on interviews with researchers or on academic peer review. Moreover, in the existing frameworks, stakeholders are only considered at the end of the process. Existing frameworks provide, therefore, incomplete approaches to evaluate RRI. As discussed about the production of knowledge along the lines of RRI requires adequate accountability frameworks that engage stakeholders to define the research mission and correlated impact indicators in a collective bottom-up approach.

The tools, measurement units and indicators best representing research impact are seen as essential to diffuse and institutionalize the RRI approach (Delaney and Iagher, 2020). However, RRI policies have not provided specific guidance about how to operationalize those principles in the assessment of research processes and outcomes (Morton, 2015). Different studies have tried to operationalize RRI (Silva *et al.*, 2018; Silva *et al.*, 2021; Wickson and Carew, 2014). However, the construction of RRI tools and indicators has proved to be a Sisyphean task because, as mentioned in the background, the definition of research impact and the design of research assessment metrics are inextricably linked. Accounting has the potential of reshaping reality (Hines,



1988). These ideas are in line with the understanding of accounting as a technology making visible specific issues by creating evaluation rules (Busco and Quattrone, 2018b) such as indicators (e.g., Gendron *et al.*, 2007) and models (e.g., Millo and MacKenzie, 2009). Concerning the Sisyphean task of constructing research impact indicators in an RRI context, it is pertinent to refer to the notion of the incompleteness of performance measures. Considering the ambition and complexity of RRI, reflected in the diversity of research impact models proposed, finding the philosopher's stone of RRI research impact seems rather impracticable. In contrast, the accounting literature (Busco and Quattrone, 2015) explains how the incompleteness of performance measurements offers an opportunity for debating the various perspectives involved in such incompleteness, which “cannot easily be translated into the common language of accounting metrics” (Busco and Quattrone, 2018b, p. 16, see also Jørgensen and Messner, 2010) being needed “negotiations around (...) performance indicators in their association to strategy definition and implementation” (Busco and Quattrone, 2018b, p. 16). These ideas are mobilized in this study to explore whether and how accounting artifacts and concepts, always incomplete, have the potential of activating knowledge to achieve the innovations (Revellino and Mouritsen, 2015) needed for the transformation of research performance evaluation towards RRI.

### **3. The MULTI-ACT Collective Research Impact Framework**

The Horizon 2020 project MULTI-ACT, aiming at constructing a collective research impact framework, is the case studied in this paper. In the following, we frame the case project and elaborate on the process of data collection and analysis.

#### *3.1 The case project*

MULTI-ACT is a project funded under the EU SwafS programme[3] between May 2018 and April 2021 (<https://www.multiact.eu/>). Under the umbrella of RRI, *Science with and for Society* (SwafS) is part of the EU Horizon 2020 research programme and intends to “build effective cooperation between science and society (...) and to pair scientific excellence with social awareness and responsibility” (Delaney *et al.*, 2020, p. 12).

MULTI-ACT aimed at developing an innovative model representing research impact in the area of multiple sclerosis in consonance with RRI: a Collective Research Impact Framework (CRIF) (Zaratin *et al.*, 2022). This model “[was proposed to be] applicable in defining the scope of health research as well as new metrics for the

*evaluation of its results*” (<https://www.multiact.eu/>). The project focuses on the case of multiple sclerosis: a disease of the central nervous system that can cause serious disability, with 2.3 million people suffering it worldwide and for which there is an imperative need for better treatments (Zaratin *et al.*, 2016). The project consortium was led by the Scientific Director of the Italian Multiple Sclerosis Society Foundation (FISM thereafter; <https://www.aism.it/>). FISM is characterized as a patient organization and the Scientific Director has a long trajectory in drug discovery and development and neuroscience research.

In line with previous proposals (Mazzucato, 2018), CRIF introduces a mission for health research that would align research efforts with, and accelerate the translation of research results to, actual applications to improve sustainability or people’ lives. More specifically, the mission introduced by MULTI-ACT was to increase the impact of health research on people with these brain diseases. A core element to pursuing this task was public engagement (a core SwafS’ principle), promoting participatory multi-actor dialogues to foster the alignment of research and innovation processes and outcomes with a wide range of societal needs and perspectives. In that respect, MULTI-ACT CRIF aimed at opening research evaluation to multiple stakeholders (patients, patient organizations, health researchers, health care providers) and enlarging the range of potential research impacts beyond excellence and efficiency. The composition of the consortium project illustrates the importance of public engagement in MULTI-ACT: it was integrated by research funding organizations, patient organizations, health researchers, health care providers, experts in information technology, accounting practitioners and accounting researchers.

### *3.2 Data collection and analysis*

The most important source of data in this paper derives from the direct involvement of the authors as members of the MULTI-ACT and the interaction with health research stakeholders. The authors worked on different tasks and work packages, writing deliverables, participating in more than one hundred consortium meetings, attending conferences and carrying out interviews in order to gather information for the development of the project. We also had access to and contributed to the work of other consortium members. Two of the researchers kept field notes about the themes and issues raised at meetings, informal conversations and the events that they attended, recording

observations on the day-to-day operation of the project[4] (Berg and Lune, 2012; Hammersley and Atkinson, 2007). Close engagement with the project offered an opportunity to gain first-hand knowledge and experience about how accounting was conceived by different stakeholders to contribute to transforming metrics to increase health research impact. Among the different forms of observation/participation identified by Kawulich (2005), the researchers adopted the role of complete participants. Such level of engagement also allowed us to not only to contribute with our own ideas, actions and interpretations, but also to understand the potential of “accounting in action” (O’Dwyer and Unerman, 2016, p. 39) and the related processes and dynamics produced in the interaction with multiple stakeholders.

Regarding data analysis, given the depth of our participation, data collection and interpretation are not easily distinguishable. In fact, our personal experience was instrumental for interpretation. However, in an attempt to take some distance from the case, to write this paper the authors reviewed the collected data and personal experiences (Hammersley and Atkinson, 2007), while keeping in mind the purpose of this paper. This analysis facilitated the identification of themes (e.g., incompleteness of accounting and creation of opportunities for discussing the way to operationalize RRI assessment), which were coded to reduce the amount of information and make the data more accessible (Berg and Lune, 2012). To limit bias and ensure research validity and authenticity, the themes were identified separately by each author and discussed periodically with coauthors in different meetings and in different versions of the analysis exchanged.

This reflexive process fostered the ‘collective’ learning of the research question (Schneider *et al.*, 2019). Engagement research present challenges deriving from the importance of both *closeness* to the field (De Jong *et al.*, 2013) and analytical distance (Woodthorpe, 2007), but as important as ‘closeness’ for an adequate analysis of the data. We followed different strategies to find the right balance between closeness and analytical distance (De Jong *et al.*, 2013; Woodthorpe, 2007). On the one hand, reflexive distance was achieved by building on our own surprise. A good illustration is provided by how the incompleteness of the set of indicators studied, negotiated and agreed in MULTIACT generated opportunities for enquiring about the generative nature of accounting. On the other hand, a stronger level of reflexive distance was reached “*through literally moving out of the field, thus creating a breach in the often-intimate relations with those*

*researched*” (De Jong *et al.*, 2013, p.178). This was facilitated by the fact that the analysis was carried out after the end of the project (April 2021).

#### **4. Building a framework and a master scorecard for health research**

This section outlines an analysis of the MULTI-ACT case. This presentation starts with an introductory general discussion of the centrality of accounting in the MULTI-ACT project, followed by the examination of two themes that allow us to reflect on the question of how accounting can contribute to transform the existing metrics in research performance evaluation: the development of a conceptual framework for the CRIF and the co-construction of performance indicators.

##### *4.1 MULTI-ACT: the centrality of accounting and accountability*

MULTI-ACT resulted from the confluence of FISM’s Scientific Director ideas about the transformation of current methods of research assessment (Zaratin *et al.*, 2014; Zaratin *et al.*, 2016) with the Integrated Accountability Model (IAM thereafter) proposed by Andraeus and Costa (2014). The IAM model defined different accountability dimensions (mission, economic and social) to account for the social responsibility of nonprofit organizations.

The decisive translation between the patient organization (i.e., FISM) and the accounting academy (i.e., Andraeus and Costa) was provided by a senior consultant on corporate strategy, something that made the accounting craft central to the MULTI-ACT conceptualization. Despite the ignorance of accounting academics in health research, the consensus in MULTI-ACT was that their knowledge provides them legitimacy to intervene in issues of broad “*public importance*” (Spicer *et al.*, 2016), and more specifically in the transformation of the research field by focusing on equity, sustainability and health research impact. As one of the accounting researchers participating in the project affirmed: “*accountants [and by extension accounting scholars] have knowledge to contribute to the transformation of existing methods of research assessment*” (field note of an informal conversation, 2018).

The multi-stakeholder perspective required for RRI represents a collective perspective that challenges not only current forms of research assessment, but also the consideration of accounting scholars as experts. The tension between the expert role attributed to accounting scholars and the principles of RRI (e.g., co-production of

knowledge) required some level of “*reflexivity*” (Alvesson *et al.*, 2008) to problematize the role that accounting can play in the development of a more democratic assessment of knowledge production. Specifically, accounting scholars collaborated in developing a conceptual framework for the CRIF and in trying to design an operational scorecard with indicators that are suitable for the project objectives and that are integrated within the CRIF governance model[5] and stakeholder engagement strategy. These developments tried to foster an “*assessment of health research impact that facilitates working together science and society...*” (Project leader, MULTI-ACT project monitoring meeting, field note, 2021) in line with RRI co-creation. The CRIF (including the devised indicators) was translated into a digital *toolbox* that is intended to allow users to assess research impact from a multi-stakeholder perspective (e.g., the patient’s) (<https://www.multiact.eu/>) and into a set of guidelines to help in its implementation.

#### 4.2 Accounting in the RRI co-production of knowledge

##### *Conceptual framework for the CRIF*

MULTI-ACT sought to develop brand-new tools, procedures and metrics of the value generated by health research to society and capable of *measuring* the value generated by health research to society. The development of the CRIF conceptual framework commenced with a reflection on a comprehensive and multi-stakeholder perspective of health research outcomes and impacts. The IAM provided by accounting scholars to the field of conventional research metrics (Andreus and Costa, 2014) was crucial. As mentioned above this perspective developed the notion that economic accountability and social accountability should be accompanied with a third *mission* accountability dimension, related to the “*set of values that the organization intends to produce for its stakeholders and for the broader society*” (Andreus and Costa, 2014, p. 168). The IAM was further developed in MULTI-ACT, including two further dimensions in the CRIF, which adds research *excellence* (excellence dimension) to account for research quality, to the economic and financial impact of research related to *efficiency* (economic dimension), the effects of health research in *society* (social dimension), and the strategic priorities related to health research challenges and *mission* (efficacy dimension). The CRIF also included patients as a fifth dimension (patient reported dimension), transversal to the other four dimensions (see Zaratin *et al.*, 2022 for further details about the model).

It is noteworthy that although different stakeholders collaborated in the conceptualization of the CRIF, it followed the IAM proposed by Andreaus and Costa (2014), which was tailored to include research excellence and the centrality of patients in health research assessment. This illustrated the centrality of accounting and accountability ideas in the MULTI-ACT aims of fostering the value of health research to patients and society. In order to develop the CRIF, the MULTI-ACT consortium explored the academic and grey literature from various research fields to identify the process used for integrated assessment models in multi-stakeholder initiatives. However, one of the main problems encountered in the existing initiatives was that despite the diversity of methodologies proposed, the steps followed in the different initiatives were not immediately applicable to the specific field of health research. These methodologies did usually not consider the multiple stakeholders involved in health research. The incompleteness of the existing methodologies for assessing research impact in consonance with RRI paved the ground for the interchange of ideas (Busco and Quattrone, 2015; Busco and Quattrone, 2018b) about how to foster research impact. Here, a continuous dialogue with members of two organizations participating in the project (an accounting firm and data analysts specialized in the health care sector) was necessary to make collective sense of the integrated assessment model by tailoring a list of specific steps capable of aligning the measurement of research impact with the mission of improving the patients' well-being in the long term. These steps were defined through a collaborative process (Nonaka, 1994), which was possible by the “*compromise of the MULTI-ACT participants with the aim of the project*” (Accounting researcher, field note of an informal conversation, 2021) and the shared belief among the members of the project “*that th[eir] competences are complementary, and they need to work together*” (Accounting researcher-leader of the academic team, MULTI-ACT telco, transcript, April 2019).

Building on Andreaus and Costa's (2014) IAM, the project consortium agreed to define a set of steps on what was called the *five accountability pillars* (Zaratin *et al.*, 2022), allowing the mobilization of a methodology for the assessment of research impact in a multi-stakeholder setting: (1) mapping of stakeholders and establishment of objectives, (2) development of an operative framework, (3) co-selection of indicators as well as (4) the shared measurement system, and (5) reporting, monitoring and assessment. Those pillars allowed consent on two crucial elements of the methodology, i.e., the

recursive (cyclical) approach required for research assessment and monitoring and the link between measurement and research mission.

#### *Co-construction of performance indicators*

A scorecard including selected indicators, called in the project *Master Scorecard* (MSC) was devised to translate the MULTI-ACT philosophy into action. The MSC was developed through a process that involved a review of the literature and relevant initiatives, and a process of expert consultation and engagement with stakeholders. Accounting scholars coordinated the identification and development of the MSC indicators that could help to assess each CRIF dimension's different aspects. These indicators were co-constructed considering the ties between dimensions as well as the interests of patients through the above-mentioned engagement process. The development process of the MSC followed two main steps.

The first step consisted in a review of the “literature and multi-stakeholder initiatives” that allowed creating a database including “1,556 impact indicators” (see Kork *et al.*, 2021, p.3) that were initially classified by the MULTI-ACT team according to the CRIF dimensions. The second step consisted in engaging with multiple sclerosis research stakeholders through a series of strategic working meetings and interviews (Kork *et al.*, 2021). This engagement sought to validate the CRIF dimensions, aspects and measurement strategies. The definition of the final list of stakeholders to engage “*was not an easy task*” (Accounting researcher, field note of an informal conversation, January 2022). Such selection triggered tensions between two distinct approaches. Some project partners, experts in information technology, upheld the need for an objective algorithm that could unbiasedly select stakeholders. This rationale makes sense considering that some stakeholders might be more salient than others.

“[The most salient stakeholders are] researchers for sure... I think more and more we're paying attention to patients' organisations in the planning and evaluation of funding programs.” (Director of an International Research Agency, member of the project's external advisory board; interview, January 2019)

“The stakeholders are first and foremost obviously the citizens... The second, of course, is the researchers...” (Policy maker, member of the project's external advisory board; interview, January 2019)

The rationale underlying the MULTI-ACT project was to empower stakeholders who may compensate their relatively less power with their legitimacy (e.g., patients). This stand was supported by academics with theoretical arguments about different stakeholders' attributes (Mitchell *et al.*, 1997). In this regard, one of the accounting researchers participating in the project explained that “*in accountability theories, the stakeholders who are more relevant are those with more power, but the idea of the MULTI-ACT project is to empower who has less power and, for instance, is legitimate such as patient*” (MULTI-ACT telco, transcript, August 2018). Accounting scholars produced a ‘generative’ discussion on a rough list of stakeholders that was subsequently refined by considering research priorities and stakeholder attributes. This proposal was finally supported by the whole MULTI-ACT consortium.

The first strategic meeting (September 2018) was crucial for the project as it represented a successful platform to collaborate with a core group of stakeholders relevant to the project objectives. The stakeholders were members of the project’s “external advisory board” including “academia, patients & patients’ organizations, pharma industry, healthcare organizations, health authorities, health innovation and neurodegenerative diseases” (Kork *et al.*, 2021, p.8). Those stakeholders were instrumental for the development of the project over its whole life. The objective of the meeting was to consider and integrate their perceptions and interests in the development of health research performance indicators (Kork *et al.*, 2021), which as the project leader asserted: “*is consistent with the idea of co-creation and collaboration on the basis of the EU work program*” (MULTI-ACT telco, transcript, July 2018). All the participants in the meeting, not only those representing healthcare and patients’ organizations, highlighted the relevance of including patients’ perspectives, but also family and close relatives’ perspectives in the development of such indicators. This meeting also contributed to reaching a common understanding among the members of the MULTI-ACT consortium about the objectives and methodology of the project.

A set of interviews were also carried out between December 2018 and February 2019 with members of the project’s external advisory board, representing different stakeholders. These interviews confirmed a need to refine indicators (Kork *et al.*, 2021) and provided knowledge and understanding of how each dimension could be measured and what needs to be considered in doing so. Crucially, it corroborated the need to cluster relevant indicators into different measurement aspects for each dimension. The relevance



of including patients' and family and close relatives' perspectives (and society at large' perspective) in the development of CRIF was validated by the interviewees. Patients' representatives recommend further consideration of stakeholder engagement from the beginning of the research process when assessing mission, excellence and social dimensions of research impact *“to make sure that the patients are operating with the utmost information ... and make sure that their impact is happening at the right point and its truly reflecting the view of the whole patient community”* (Representative of a healthcare and patients' organizations; interview, January 2019). Among the CRIF dimensions, interviews supported the relative preeminence of the mission and excellence dimensions. Interviewees also addressed the interaction between different dimensions. For example, improving patients' quality of life (mission) could generate organizational efficiency by *“[decreasing] staffing hours... pharmaceutical expenditure... admissions to hospitals...”* (Healthcare international project manager and external expert in the European Commission, similar assertion from patients' representative, interview, January 2019). To raise awareness of those interactions, they provided insights into the need to evolve towards an integrated assessment.

*“An integrated structure that sees different aspects of research working together, plays an important role in the ability to produce an impact of research.”* (Healthcare researcher; interview, January 2019)

*“Maximizing connection in multisclerosis research and building a relationship will be key. It is instrumental to enable impact on different dimensions... that can be efficiency, excellence of social...”* (Healthcare international project manager and external expert in the European Commission; interview, January 2019)

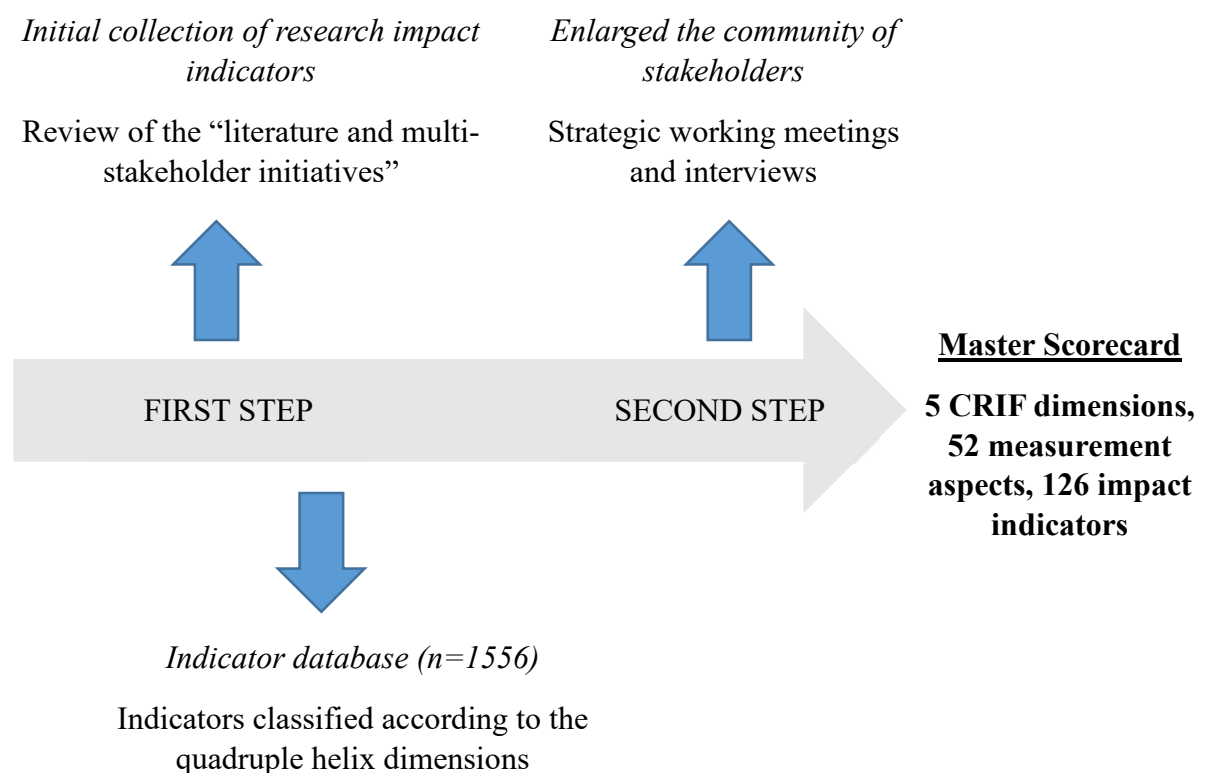
Furthermore, participants in interviews and strategic meetings suggested the separation between mission and excellence as somewhat artificial.

*“Well, for the moment, unfortunately, excellence is a word which has been very much related to journals and publications [...] I think that the excellence will move towards something more related to whatever is coming out of my research is reproducible and is useful.”* (Director of an International Research Agency; interview, January 2019)

The outcome of this co-construction process (see Figure 1) was the above referred MSC (see Kork *et al.*, 2021 for further details about the operationalization and functionalities

of the MSC). The MSC includes 126 potential indicators classified into 52 “*measurement aspects related to each of the five CRIF dimensions*” (excellence, efficacy, economic, social and patient-reported). The feedback received from the stakeholders allowed us to easily operationalize the MSC, selecting at least one core and two additional indicators per aspect. For each aspect, at least one core indicator was identified (which can be expected to be used by initiatives/projects for which the aspect is relevant). Additionally, the MSC provides additional indicators (which are expected to be used by initiatives/projects for which the required information to provide the core indicator is unavailable) (see Tables 1 and 2). This scorecard became a key building block of the MULTI-ACT CRIF model, together with the above-mentioned governance model and the guidelines to engage stakeholders.

**Figure 1. The key phases in the development process of MULTI-ACT Master Scorecard.**



Source: MULTI-ACT project

**Table 1. The MULTI-ACT Master Scorecard and the distribution of indicators**

<b>Dimensions</b>	<b>Aspects</b>	<b>Indicators</b>	<b>Core indicators</b>	<b>Additional indicators</b>
Excellence	20	57	20	37
Efficacy	9	22	9	13
Economic	9	20	9	11
Social	6	15	7	8
Patient-reported	8	12	10	2
<b>Total</b>	<b>52</b>	<b>126</b>	<b>55</b>	<b>71</b>

Source: MULTI-ACT project (see also Kolk *et al.*, 2021)

**Table 2: Distribution of core and additional indicators per dimension and measurement aspect in MSC**

<b>Dimension/aspect</b>	<b>Core</b>	<b>Additional</b>
<b><i>Patient Reported Dimension</i></b>	<b><i>10</i></b>	<b><i>2</i></b>
Anxiety and depression	1	
Bladder function	1	
Cognitive function	1	
Fatigue	1	
Locomotion	1	
Patient satisfaction	1	2
Return on engagement	3	
Upper-limb dexterity	1	
<b><i>Economic</i></b>	<b><i>9</i></b>	<b><i>11</i></b>
Anti-competitive behaviour	1	
Control	1	1
Economic externalities	1	3
Financial performance	1	2
Improvement of health services	1	
Intellectual property	1	
Market	1	2
Organizational efficiency	1	2
Resources allocated	1	1
<b><i>Efficacy</i></b>	<b><i>9</i></b>	<b><i>13</i></b>
Drug supply to patient	1	1

Governance	1	
Health service assessment	1	2
Health services and products accessibility	1	2
Healthcare practitioners human capital	1	2
Improvement of health services	1	2
Influence on patient behaviour	1	1
Patient quality of life	1	2
Stakeholder engagement	1	1
<b><i>Social</i></b>	<b>7</b>	<b>8</b>
Corporate reputation	1	
Ethical marketing	1	
Labor	1	
Labour		3
Political externalities	1	2
Socio-environmental impacts	2	3
Stakeholder engagement	1	
<b><i>Excellence</i></b>	<b>20</b>	<b>37</b>
Academic production	1	2
Anticipatory design	1	
Bibliometric	1	2
Communication	1	2
Compliance	1	2
Ethics and integrity	1	2
Financial resources	1	2
Impact evaluation	1	2
Influence on public behaviour	1	
Influence on subsequent research	1	2
Informing healthcare practice decision making	1	2
Intellectual property	1	2
Patient engagement & involvement	1	2
Products generated	1	3
Research partnership	1	2
Research recognition	1	1
Researchers' human capital	1	3
Resources allocated	1	2
Scientific input	1	2
Stakeholder engagement	1	2
<b>Total</b>	<b>55</b>	<b>71</b>

Source: MULTI-ACT project (see also Kolk *et al.*, 2021)

## **5. Co-constructing accounts for research impact: some observations on the performative and constructive role of accounting**

This section discusses the performativity of accounting and the potential of accounting metrics to make visible “new realities” in the context of health RRI. Some insights are organized around three nodal points. First, how the notion of accountability was mobilized in MULTI-ACT to align research assessment metrics and assessment with RRI to increase health research impact. Second, how the incompleteness of the MSC and the indicators created opportunities for discussing the way to operationalize RRI assessment. Finally, how such incompleteness, also enforced the diversity of research impacts considered and the flexibility of research impact performance assessment.

### *5.1 The mobilization of democratic and participatory accountability*

Central to MULTI-ACT was the idea that in order to activate the paradigm shift advocated by the RRI approach and respond in a balanced way to the interests of actors (Pedrini *et al.*, 2018), a wider-ranging, holistic expert knowledge needs to coalesce, engaging multiple perspectives, not only in the definition of performance indicators, but also in the collection of data and the assessment of strategies over the long term. The notions of accountability and collective accountability in line with ideas developed in prior academic work of the academic team (e.g., Andreaus and Costa, 2014; Costa and Pesci, 2016; Pesci *et al.*, 2020) were mobilized to support an inclusive perspective of accounting. Over the course of the project, the flexibility of the notion of accountability (used to mean responsibility, responsiveness, or measurement depending on the circumstance) allowed MULTI-ACT participants to reach a consensus around the importance of aligning indicators and accounting with the MULTI-ACT’s aspiration to achieve the maximum impact of health research and stepping away from the conventional *answering-machine* understanding of accounting (Burchell *et al.*, 1980). The project leader attributed ever-greater importance to the need for more knowledge about the co-accountability concept for the successful implementation of the project:

“The aim of the meeting is to share with you [more information about] the co-accountability approach in order to develop metrics to measure the impact of research. This is the main goal of our collaboration with the stakeholder[s]”.

(Project leader's speech in one of the first (informal) meetings on the monitoring of the MULTI-ACT project)

The mobilization of the notion of accountability changed the terms of the conversation in the project. However, this shift was not possible until the project's leader (with a high degree of authority) became convinced of the importance of this broader accounting perspective and adopted this narrative in her discourse. The project leader acted as an "entrepreneur" in mobilizing a new accounting narrative that became central in the MULTI-ACT consortium. This shows how the existence of certain circumstances is key to fostering performativity (Callon, 2007; MacKenzie, 2007; see Revellino and Mouritsen, 2015 for a review of these ideas). In this case, the IAM along with the narratives provided by accounting researchers and the drive of the project leader created the conditions to mobilize democratic and participatory accountability; thus allowing accounting and accountability systems to shift the metrics employed thus far in research performance evaluation.

### *5.2 Incompleteness of the master scorecard created opportunities*

Despite the progress made in the MULTI-ACT project regarding the transition from conventional accounting to democratic and participatory accountability, the accounting tools developed in the project remained incomplete in certain aspects. Two of those aspects refer to CRIF's context of application and its integration in the governance model.

Regarding the context of its application, it is worth noting that the "MULTI-ACT digital toolbox" is accessible for the *users* of information (Zaratin *et al.*, 2022). However, the question of who are the actors that could interact with the CRIF through this tool was elusive in a transformational setting, where who are the providers, analysts and users of information is an open-ended question. In different meetings, especially addressing the development of the toolbox, participants discussed the primary and secondary user profiles and questioned whether they represented what could be considered important users. They agreed that primary users could include *research funding and performing organizations* (RFPOs) leading/co-leading a formally constituted multi-stakeholder research initiative or planning to set up a multi-stakeholder research initiative. RFPOs could also seek to assess the collective impact of running or completed programmes or projects. Participants also supported that secondary user profiles could include third sector organizations such as patient associations or advocacy organizations, EU RRI and

health research projects, individual citizens and policy makers. However, the matter of who are the CRIF users was never completely settled. This would have the effect of extending the “*playing field*” in which accounting can operate (Kornberger and Carter, 2010, p. 340), leaving open the use of CRIF and the MSC to a variety of organizations and projects that can benefit from accounting inputs provided to the development of MULTI-ACT. This reinforced the possibilities for accounting to produce effective institutional changes and collective impacts, which are, as the project leader has repeatedly pointed out “*the ultimate and desired goal*” of this project.

A further opportunity for discussion of how to make the assessment of RRI operational emerged from the integration of the MSC into the governance model. While the CRIF governance model and the MSC had developed in parallel, the governance model included co-accountability as one of the key elements of its transformational agenda. This rationale, shared by all the MULTI-ACT members, was clearly problematized by one of the members of the project’s external advisory board:

“I think that perhaps the determining element is the governance itself, that is, we have traditional indicators of governance because, in a traditional logic of opposition of powers, one dominates power over the other and consequently it drags objectives and indicators [...] the right governance then you can perhaps have that integration that you then find again [...] with the governance model... power to define indicators...” (Healthcare researcher of the project’s external advisory board, December 2018)

Similar ideas were maturing around the MSC and the governance model (see Zaratin *et al.*, 2022 for further details about the governance model). It soon became clear that there was a “*need to integrate MSC into the governance model in a way that allowed the evaluation of multi-stakeholder research initiatives in line with the co-accountability pillars*” (Accounting scholar participating in the MULTI-ACT project, one of the last (informal) meetings on the monitoring of the MULTI-ACT project). By the end of 2019 overlaps and inconsistencies between the governance and the accountability models surfaced, creating confusion among project participants. The project consortium had agreed on the *five accountability pillars* to conceive the integration of the MSC into MULTI-ACT’s transformative ambition to link research impact and mission and provide it with the recursive approach required for assessment and monitoring. At the same time,

the governance model had included a linear *governance program* with some assessment and monitoring elements “*but many of the participants in the MULTI-ACT found it difficult to visualize the integration of governance and accountability models*” (Accounting researcher, field note of an informal conversation, January 2022).

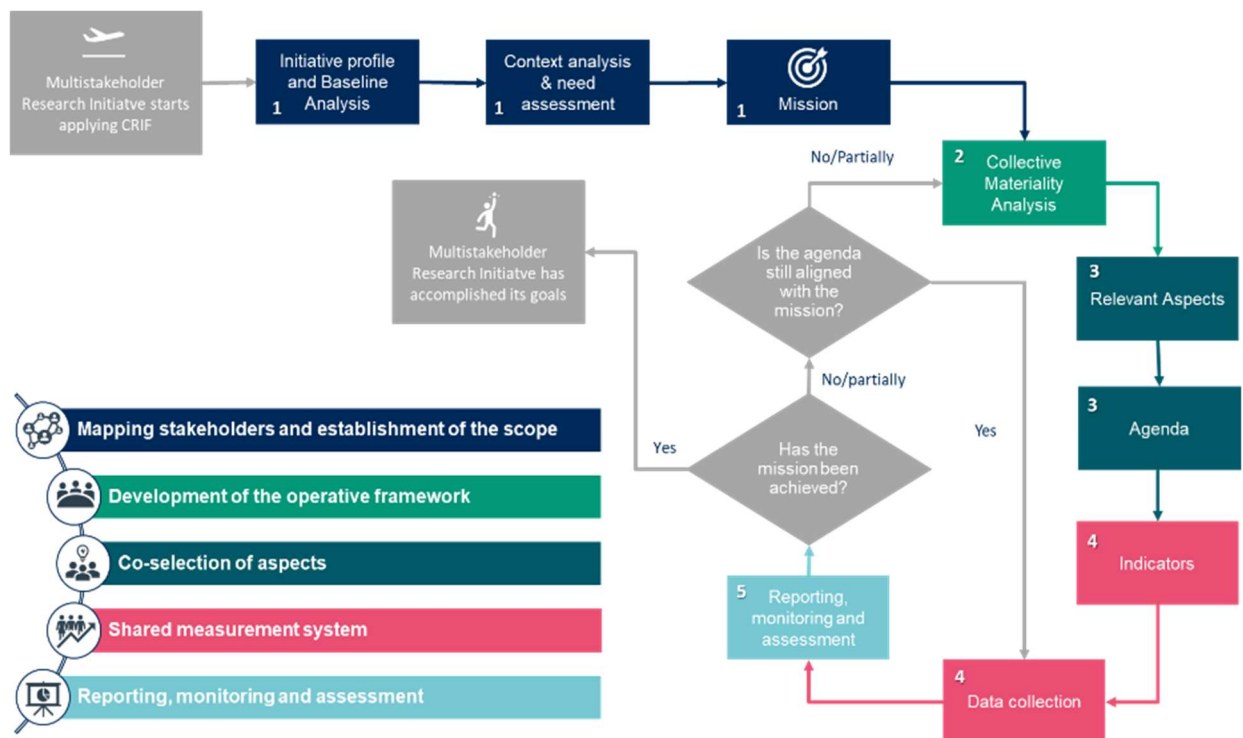
The overlaps and inconsistencies of the governance and accountability models produced a discussion on the right model to keep for CRIF implementation. During this discussion, accounting researchers observed the linearity of both models became problematic and the solution for dealing with these inconsistencies was the merging of both models into the *CRIF workflow* (see Figure 2) i.e., a depiction of the recursive (cyclical) phases to be followed for the adoption and implementation of the CRIF (Zaratin *et al.*, 2022). The cyclical approach was proposed by some consortium members to foster the aim of ensuring the *continuous* improvement of research initiatives through the integration of the MSC into the governance model. Accounting researchers also observed some MULTI-ACT partners such as experts in information technology could not see why the workflow had to be a circular process of analysis of the initiatives considered instead of a linear process. Proponents of the cyclical approach realized that the existence of different groups and backgrounds (Costa and Pesci, 2016; Friedman and Miles, 2006) was detrimental to making their case. Therefore, they decided to move the discussion from conceptual to graphical representation “*with the hope that they would see more clearly what we were trying to say*” (Accounting scholar participating in the MULTI-ACT Project, Accounting researcher, field note of an informal conversation, January 2022).

Different meetings and discussions were held around different ways graphical representation of the *CRIF workflow*. The rationale provided in Figure 2 is the result of numerous discussions. Still, the project leader’s authority in this early stage of development of new forms of research impact assessment was instrumental for the consensus and the related emergence of new “accounting visualizations” (e.g., figures) “generat[ing] productive tensions” (Busco and Quattrone, 2018a, p.1). In our case, these tensions triggered “*repeated discussions about the appropriateness of these ideas about the MULTI-ACT mission*” (Accounting researcher participating in the MULTI-ACT project, field note of an informal conversation, December 2021) that ended with an agreement among MULTI-ACT participants about the appropriateness of the recursive approach. It can thus be said that this discussion about figures enabled some of the actors



to visualize new possibilities that they had not imagined until then, and therefore, the “visual power of accounting” (Busco and Quattrone, 2018b, p.16; see also Jordan and Messner, 2012) was fostered in a field yet under-reported by the accounting literature on incompleteness and the generative role of accounting.

**Figure 2. The MULTI-ACT CRIF workflow**



Source: Work package 6.1 MULTI-ACT project

In sum, the elusive answer to questions such as who the user of the CRIF is or how the MSC is to be integrated into the governance model derived from the incompleteness and its associated ambiguity (Quattrone, 2017) of certain aspects associated with the MSC, thus creating opportunities for discussing how to translate RRI to research assessment in a workable setting.

### 5.3 Flexibility and adaptability in the selection of indicators for each initiative

The incompleteness of the MSC and its indicators generated additional opportunities for fostering the generative nature of accounting through, for example, decisions about

selecting the appropriate indicators for each initiative. This question shaped the agendas of the various meetings, in which accounting scholars, along with other representatives such as patient organizations, proposed that “*the MSC should have characteristics such as adaptability and flexibility*”. Likewise, a notable element of the discussions that emerged in the MSC construction was accounting scholars’ proposal for qualitative indicators.

However, some stakeholders (e.g., some health care researchers, experts in information technology, data analysts and accounting practitioners) were initially reluctant to support these characteristics. The plurality of actors embedded in the same working community for several years represented, at some stages, a challenge for this project. These actors were intrinsically different in their motivations, rules of practice, and behavior. For example, health research protocols are systematic, leaving little room for flexibility; health researchers could associate adaptability and flexibility with an apparent lack of validity and reliability. This led sometimes to misunderstandings and different views about how to approach specific issues (see e.g., Morton, 2015; Taddeo, 2016 for further perspectives in this area), making it difficult to connect all the implicated rationalities with the language of accounting researchers (Busco and Quattrone, 2018b; Jørgensen and Messner, 2010).

Concerning the case of MSC adaptability and flexibility, the MSC was conceived to be adaptable to ensure initiatives could add new indicators in response to patients’ specific needs, and flexible in the selection of indicators used to assess impact in every RRI project/initiative, since the relevance of each indicator depends on user’s needs and the specific mission of the initiatives. After long discussions about the need for *adaptability* and *flexibility* in order to minimize the risks of *objective* and fixed indicators on research impact, participants eventually agreed that such approach would be useful for achieving the MULTI-ACT mission. Hence, it could be said that the accounting perspective helped to *reformulate* some MULTI-ACT participants’ initial views, and in doing so, exposed its emancipatory and enabling effects (Ahrens and Chapman, 2004), instilling new ideas for changing the evaluation of research performance: it is important to bear in mind that the motivation for MULTI-ACT, as an RRI initiative, is questioning (and transforming) conventional metrics of research impact that are producing short-sighted research (Durose *et al.*, 2018).

The consensus about the need for these characteristics was materialized, for example, in the proposal of a collective materiality analysis (see Figure 2) to select what specific indicators each research initiative would use. Although in MULTI-ACT, the research impact is modelled on five key dimensions (transferred into specific aspects and indicators), the specific set of indicators that each research initiative aims to measure depends on the outcome of its materiality analysis, through which the stakeholders collectively prioritize the aspects and build their own MSC, “*an approach that is key to identify and select the most relevant impact aspects for the mission of each initiative*” (Project leader’s speech in one of the last meetings on the monitoring of the MULTI-ACT project, similar assertions from accounting scholars and representatives from healthcare and patients’ organizations in meetings and telcos on the monitoring of the MULTI-ACT project). *Adaptability* and *flexibility* principles are also introduced into the governance model through the benchmark analysis, which establishes the minimum aspects that an organization must have in order to apply the MULTI-ACT model, allowing each organization to choose the rest, considering that each organisation may have its own distinct mission and will need aspects that are appropriate for that mission. Hence, it could be also said that the accounting perspective helped to *reformulate* some MULTI-ACT participants’ initial views.

Concerning qualitative indicators, this type of indicator was considered unreliable, with some project members asking for a methodological justification for the qualitative approach accounting scholars propose.

“In my opinion, a metric is only one type of indicator: a quantitative indicator.” (Accounting practitioner’s comment during the process of writing one deliverable, January 2019)

“This definition [of indicator] comes from *GECES Sub-group on Impact Measurement 2014*. I suggest adjusting it... and clarify whether an indicator refers to an accountability metric. It can be also defined as a measure (this way qualitative indicators would not be excluded).” (Health researcher’s comment during the process of writing one deliverable, January 2019)

Accounting scholars reminded those who did not believe qualitative indicators were appropriate that the transformation of research performance evaluation towards RRI is aimed not only at specific economic objectives (such as the return on investment), but

also social objectives (such as the co-participation of all the stakeholders). Therefore, they argued the inclusion of both quantitative and qualitative objectives in the research assessment process was timely. Quantitative indicators are useful for showing whether objectives are being met. However, accounting researchers noticed that it is often the case that the desired results are not achieved because the activities needed to do so are not being carried out correctly and the assessment of those activities is then achieved through qualitative measures. By way of illustration, accounting scholars proposed a qualitative indicator called “stakeholder engagement in health promotion” (proposal contained in the indicators per dimensions and measurement aspect in MSC presented in Table 2) which consisted of the “*description of the collaboration with other societal stakeholders in health promotion*” (Authors’ field note, January 2019). This indicator plays a pivotal role in the evaluation of stakeholder engagement as a key aspect of the efficacy dimension of CRIF. The consortium finally agreed that failing to account for qualitative indicators could greatly reduce the representativeness of some CRIF dimensions, such as the social dimension, which by its very nature requires qualitative information. A lack of such information would thus reduce the potential of CRIF to achieve its mission.

## **6. Concluding remarks**

The translation of research discoveries to achieve maximum impact is a relevant question for any research field. However, how to increase the effectiveness of research remains still inconclusive and much effort should be directed to improve the implementation of RRI (Novitzky *et al.*, 2020). This paper aims to provide a better understanding of how accounting and accountability systems can support new and alternatives forms of knowledge needed to increase health research impact. This paper explores the role of accounting in the development of a broader and complete health research performance evaluation in line with RRI.

On the one hand, we document how the co-construction of knowledge between accounting and other disciplines can challenge the current practices of research impact assessment. Particularly, the case reported illustrates how accounting was mobilized for the development of new metrics to assess such impact in a more balanced and sounder way through (1) the development of a conceptual framework for the CRIF and (2) the co-construction of performance indicators. Reflexive distance from the field allowed us to shed further light on the difficulties and misunderstandings emerging from the co-creation process. These issues were part of the didactic work done by accounting scholars and

their progressive overcoming enables the diffusion and integration of new knowledge into the knowledge network (Nonaka and Takeuchi, 1995); a key aspect in order to achieve the desired institutional change. Nevertheless, this case project shows the relevance of conceiving performance evaluation systems from a broader perspective, signaling the need to study the pernicious effects of shortsighted research assessment metrics, but also the potential generative role of accounting to address the grand challenges of our society (Mazzucato, 2018). In this sense, we believe it is important to bear in mind that even though the actors involved had different backgrounds that could initially make them see some aspects differently, the existence of a common point for the development of the project (the unsustainability of the current forms of research evaluation) compensated for aspects such as a potential difference of interests that could have been determined by their different backgrounds. The health care industry literature (e.g., Hussain *et al.*, 2018; Khan *et al.*, 2018) has illustrated the relevance of shared assumptions and beliefs and the concern for excellence to put in practice a social sustainability approach, factors that pushed the development of the MULTI-ACT project.

On the other hand, the incomplete design of indicators and their integration in the MSC produced a generative discussion about how to translate RRI to research assessment in a workable setting. In this respect, for example, we illustrate how the CRIF and the MSC (and its indicators) contribute to the creation of opportunities for discussion fostering the generative nature of accounting. Moreover, we find that certain circumstances and conditions that appear during the MSC construction process, such as the presence of authoritative actors pushing accounting ideas contributed to promoting this generative discussion. Prior studies exploring corporate performance evaluation have shed some light on “conditions under which incompleteness is considered problematic or non-problematic” (Islam *et al.*, 2018, p.84; see also Jordan and Messner, 2012). However, such circumstances and conditions are underexplored in the context of performance evaluation on RRI impact. Although the project’s application has yet to be monitored, this paper shows how the incompleteness of accounting objects created opportunities for debating how their transformation could foster research impact.

These findings open pathways for health research performance evaluation as being a direction in the evolution of the accounted word. As Carnegie *et al.* (2021, p.72) highlight: “*accounting is not a mere neutral*” and “*technical practice*”. Understanding more fully the current and potential role of accounting and accountants has the potential

to shape a better world. We would like to encourage fellow researchers to continue the path of studying the transformation of research assessment to respond to the grand challenges of our society (Mazzucato, 2018). The exploration of this case project has allowed us to reflect on the fact that knowledge production is an uncertain and complex phenomenon with welfare, value, ethical, economic, and social implications requiring the perspective of different stakeholders; and that devising accounting approaches to foster knowledge production and increase research impact requires recognizing the stakes of all actors affected by knowledge production (e.g., patients) to engage and intervene in the design of research assessment frameworks. More specifically, MULTI-ACT has allowed us to reflect on the performative and constitutive role that accounting can play in promoting a sustainable return on investment of research and the generative power of accounting (and of accountants) when working in collaboration with other disciplines. Overall, this collective evaluation of research impact has proved to be useful for extending the perspective from the traditional performance (and accounting) to the impacts on society in a holistic way and the demands of RRI. Taking the case reported seriously, it could lead to thinking that the development of relevant research impact metrics requires some kind of crisis of confidence or ethics, as highlighted by Zaratina and her colleagues. Otherwise, the same incomplete research impact measures would continue to be used and the lives of patients (the primary users of health research) would continue to remain unimproved.

Our study was restricted to one specific research project lasting three years only and its application in society has not yet been concluded. Future research could look at the effects that these types of projects produce (or not) in terms of institutional changes, which must be its last aim. The effectiveness and outcomes of the CRIF and the MSC in use is something that needs to be further researched. For instance, the MULTI-ACT model is being applied by different institutions (<https://www.multiact.eu/partnerships/>) *“seek[ing] now sustainability plans to exploit initial results and turn the MULTI-ACT prototype into an up and running management tool”* (Zaratina *et al.*, 2022, p.6). Policymakers are relevant actors in harnessing and exploiting the knowledge gained in the project as they can further promote the application of the model to other types of research (within or outside the field of health research). In this way, it would be crucial for policymakers to emphasize the suitability of the CRIF framework (and the MSC) as an instrument of participatory governance and its strength in supporting collective

decision-making processes. Overall, our research points toward the need for the UE to continue promoting RRI, making more resources available, and developing plans to build on the progress already achieved in previous projects. We hope that our study will encourage accounting scholars to enrich the multifaceted implications of knowledge co-production.

## Notes

1. Knowledge production is approached in this paper as “*the process of making available and amplifying knowledge created by individuals as well as crystallizing and connecting it to an...[existing] knowledge system*” (Nonaka *et al.*, 2006, p.1).
2. Research impact is a complex concept that has been much debated, with different conceptualizations of the same being articulated (see for more detail, Morton, 2015). The concept of research impact referred to in this paper is the one that is in line with RRI.
3. MULTI-ACT is “one of the projects in the European RRI portfolio funded under the “New constellations of changing institutions and actors” call (European Commission. Horizon 2020 Work Programme 2016 – 2017, Swafs-05-2017)” (Zaratin *et al.*, 2022, pp.1-2).
4. Notes were taken during and after the completion of the project period corresponding to its evaluation phase.
5. Governance model includes “*the criteria and rules to ensure the best operating conditions for multi-stakeholder initiatives*” (see Zaratin *et al.*, 2022 for further details in this area).

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